



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/852,339	05/11/2001	Konstantin Mirotchnik	45074.32	4708

22828 7590 01/08/2004

EDWARD YOO C/O BENNETT JONES
1000 ATCO CENTRE
10035 - 105 STREET
EDMONTON, ALBERTA, AB T5J3T2
CANADA

EXAMINER

FETZNER, TIFFANY A

ART UNIT	PAPER NUMBER
----------	--------------

2859

DATE MAILED: 01/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/852,339

Applicant(s)

MIROTCNIK ET AL.

Examiner

Tiffany A Feltzner

Art Unit

2859

MW

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED Final ACTION

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Priority

2. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Canada on March 26th 2001. It is noted, however, that applicant has not filed a certified copy of the CA 2,324, 007 application as required by 35 U.S.C. 119(b). In Applicant's October 29th 2003 Response applicant claims the priority document will be filed shortly but as of the date of this office action, the priority document still has not been received. Therefore, the effective priority date for the instant application is still applicant's filing date of May 11th 2001.

Response To Arguments

3. Applicant's arguments filed October 29th 2003 have been fully considered but they are not persuasive. Applicant's arguments are based upon the fact that the **Flaum et al.**, reference fails to determine the oil or water fraction of an emulsion. (i.e. How much of the emulsion is water and how much of the emulsion is oil?) [See the Remarks

pages 2-3 of the October 29th 2003 response]. The examiner notes that none of applicant's claims require the determining of a specific "oil or water **fraction**".

Applicant's claims require only the determining of 'the oil or water "**content**" of an emulsion' (i.e. What components are present in the emulsion? What type of oil? What type of water?).

4. A **fraction** of an emulsion is different from the **content** of an emulsion because the **content** includes all possible components that make up oil, water, some other fluid and the identification of each type of fluid present; while a **fraction** includes only a portion, or part of the component fluids, in relation to (i.e. how much of) the other fluids, or the entire emulsion is present. The terms **content** and **fraction** are neither synonymous, nor equivalent. Therefore applicant is arguing a feature (i.e. a "fraction") which is not claimed.

5. Additionally, the flowing fluid(s) measured by the **Flaum et al.**, reference is/are (an) emulsion(s) because an emulsion by definition is: *a system consisting of a liquid dispersed in an immiscible liquid usually in droplets of larger than colloidal size which may or may not include an emulsifier*. The examiner notes that oil is an immiscible liquid and that water dispersed in oil is an emulsion. Additionally, a mixture of light and heavy oil is an emulsion; as is NiCl doped water and oil based mud filtrate. Mud by definition is *a solid material (i.e. usually earth) mixed with a liquid, (i.e. usually water)*. In an oil based mud the liquid is an oil, but the solid earth material, in an oil based mud filtrate, that is mixed with the oil content still comprises an emulsion. Therefore the **Flaum et al.**, reference intrinsically does teach and anticipate emulsions of oil or water, etc., even

Art Unit: 2859

though the word "emulsion" is not explicitly stated in the reference, because the essential nature or constitution of the fluids sampled and measured by the **Flaum et al.**, reference are fluid emulsions.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. **Claims 1-11 are Finally rejected under 35 U.S.C. 102(e)** as anticipated by **Flaum et al.**, US patent 6,140,817.

8. With respect to **Claim 1, Flaum et al.**, teaches "A method of determining the oil **content**" (i.e. the hydrocarbon content) "of a fluid emulsion" because the examiner considers a mixture of heterogeneous or dissimilar fluids, including oil based mud, oil based mud filtrates, water, oil, [See col. 10 lines 4-26] NiCl doped water, [See col. 8 lines 26-30] and bitumen [See col. 9 line 67] to be intrinsic anticipatory types of fluid emulsions based upon the fact that the individual fluid components are difficult or impossible to separate normally, as taught in the **Flaum et al.**, reference, [See col. 2 lines 22-37], and meet the conventional definition of an emulsion provided in the response to arguments above. (i.e. the fluids described meet the requirements for what a conventional emulsion is by definition.) The examiner notes the background teaching

of **Flaum et al.**, col. 2 lines 22-28, and col. 2 lines 28-37 where **Flaum et al.**, teaches that the **Flaum et al.**, invention is a method for distinguishing and determining formation characteristics using T2 measurements. Additionally, because the novelty of the **Flaum et al.**, reference is drawn toward the same goal, as applicant's instant application the **Flaum et al.**, reference is analogous prior art.

9. **Flaum et al.**, lacks directly teaching the term "emulsion", however the combination of fluids described by **Flaum et al.**, are fluid 'emulsions' by conventional definition. Therefore, this feature is taught by the **Flaum et al.**, reference, based on intrinsic anticipation, because the essential nature of the mixture of fluids taught is that of one or more emulsions. **Flaum et al.**, also teaches that the "emulsifier" (i.e. the fluids in combination with one another that make up the emulsion) comprise "heavy oil and water", [See abstract, Figures 10a through 11b].

10. **Flaum et al.**, also teaches " the steps of: (a) providing a low field NMR relaxometer;" (i.e. a nuclear magnetic resonance device capable of measuring at least one relaxation distribution, t_1 , t_2 , T_2^*) [See abstract, Figure 1] "(b) measuring and recording the T2 relaxation spectrum of the emulsion" (i.e. the combinational mixture of heterogeneous or dissimilar fluids which comprise one or more of light and heavy formation oil, water, oil base mud, hexane, NiCl doped water, or bitumen.) [See abstract; col. 5 lines 20-34; col. 8 lines 26-30; col. 9 line 67; and col. 10 lines 4-26], "at a temperature" [See col. 15 line 66 through col. 16 line 10 where measurements at reservoir temperature are taught.]

Art Unit: 2859

11. Additionally, **Flaum et al.**, teaches "allowing recovery of the T2 spectrum of the heavy oil;" [See col. 8 line 65 through col. 9 line 5 where the relationships of porosity and bound fluid volume, where bound fluid volume includes bound water, oil, or a combination of oil and water that does not move, requires the measurement of the full NMR T2 distribution, and col. 8 lines 20-47] "(c) determining a T2 cutoff value;" [See col. 5 lines 20-54] "(d) measuring the total amplitude of the spectrum at T2 times less than and equal to the T2 cutoff value (A_{oil}); [See col. 4 lines 12-14; col. 8 lines 20-47] "and (e) converting A_{oil} " (i.e. the signal strength or amplitude of the oil components) "to a weight value by dividing A_{oil} " (i.e. the signal strength or amplitude of the oil components) "by the amplitude index of an oil standard of known weight (AI_{oil})." [See equation 6, and equation one in combination, col. 4 line 51 through col. 5 line 59]

12. With respect to **Claim 2**, **Flaum et al.**, shows and suggests from figure 6 that "the T2 cutoff value is about 10 milliseconds". [See Figure 6] **Flaum et al.**, lacks directly teaching that the "temperature" (i.e. of the reservoir) "is about 30.degrees Celsius" However, **Flaum et al.**, directly suggests, from figure 6, that the water and oil peaks occur in the same milliseconds through seconds time range, that effectively corresponds to a temperature of about 30 degrees Celsius. [See figure 6, col. 8 lines 30-37] Additionally, **Flaum et al.**, teaches the temperature of the reservoir is determined by the CMR depth of investigation using reservoir conditions. [See col. 15 line 67 through col. 16 line 10], therefore conducting the **Flaum et al.**, apparatus and method at 30 degrees Celsius necessarily falls within the scope of the **Flaum et al.**, reference teachings. The same reasons for rejection, that apply to **claim 1** also apply to **claim 2**.

13. With respect to **Claim 3, Flaum et al.**, teaches "A method of determining the water **content**" (i.e. bound fluid volume for water and hexane) "of a fluid emulsion" (i.e. the combinational mixture of heterogeneous or dissimilar fluids which comprise one or more of light and heavy formation oil, water, oil base mud, hexane, NiCl doped water, or bitumen, [See abstract; col. 5 lines 20-34; col. 8 lines 26-30; col. 9 line 67; and col. 10 lines 4-26], as defined in the response to arguments above) "comprising heavy oil and water", [See abstract, col. 8 lines 27-47] "comprising the steps of: (a) providing a low field NMR relaxometer;" (i.e. a nuclear magnetic resonance device capable of measuring at least one relaxation distribution, t_1 , t_2 , T_2^*) [See abstract, Figure 1] "(b) measuring and recording the T_2 relaxation spectrum of the emulsion" (i.e. the combinational mixture of heterogeneous or dissimilar fluids: light and heavy formation oil, water, oil base mud, hexane) "(c) determining a T_2 cutoff value;" [See col. 5 lines 20-54] "(d) measuring the total amplitude of the spectrum at T_2 times greater than the T_2 cutoff value (A_w);" [See Figure 6 which shows t_2 measurements for values greater than the cutoff values shown in Figure 6.] " and (e) converting A_w to a weight value by dividing A_w by the amplitude index of a water standard of known weight (AI_w). [Figure 6 col. 14 lines 49-61]. The same reasons for rejection, that apply to **claim 1** also apply to **claim 3**.

14. With respect to **Claim 4, Flaum et al.**, suggests "determining the total weight of the sample", because **Flaum et al.**, conducts density measurements of mass/volume which are considered by the examiner to be a type of weight measurement. [See col. 8 line 20 through col. 11 line 57, abstract] "and determining the oil content of the emulsion

by subtracting the water content of the sample from the total weight of the sample." [See col. 8 line 20 through col. 11 line 57, abstract, Figure 8b] The same reasons for rejection, that apply to **claims 1, 3** also apply to **claim 4**.

15. With respect to **Claim 5, Flaum et al.**, teaches and shows "An apparatus for determining the oil content of a flowing fluid emulsion comprising heavy oil and water" [See abstract, Figure 1] "comprising: (a) a low field NMR relaxometer having a NMR magnet positioned in proximity to a channel through which the emulsion flows" (i.e. the combinational mixture of heterogeneous or dissimilar fluids: such as light and heavy formation oil, water, oil base mud, NiCl doped water, or hexane which are considered by the examiner to be an emulsion flow)," said relaxometer for measuring the T2 spectrum of a the sample;" [See col. 5 lines 20-34; col. 5 lines 39-54] "(b) means connected to the relaxometer for measuring total T2 amplitude below a T2 cutoff value, wherein a substantial portion of the spectrum attributable to the oil is at T.sub.2 values less than or equal to the T2 cutoff value;" (i.e. the means in the **Flaum et al.**, reference is the processor subsystem 7) [See Figure 1 col. 6 line 36 through col. 7 line 3; col. 4 lines 12-14; col. 8 lines 20-47] "and (c) means for converting the total T2 amplitude value to a weight value" (i.e. the means in the **Flaum et al.**, reference is the processor subsystem 7) [See Figure 1 col. 6 line 36 through col. 7 line 3]. The same reasons for rejection, that apply to **claims 1, 3** also apply to **claim 5**.

16. With respect to **Claim 6, Flaum et al.**, shows "the T2 cutoff value is about 10 milliseconds." [See Figure 6] The same reasons for rejection, that apply to **claims 1, 3, 5** also apply to **claim 6**.

17. With respect to **Claim 7, Flaum et al.**, teaches and suggests that "the relaxometer" (i.e. the NMR well-logging device which detects t2 and t1 components) "operates at less than about 2 MHZ.," because the operational frequency of the device is taught to be 1Mhz. [See col. 1 lines 15-33]. The same reasons for rejection, that apply to **claims 1, 3, 5** also apply to **claim 7**.

18. With respect to **Claim 8, Flaum et al.**, teaches and suggests that "the relaxometer" (i.e. the NMR well-logging device which detects t2 and t1 components) "operates at about 1 MHZ.," because the operational frequency of the device is taught to be 1Mhz. [See col. 1 lines 15-33] The same reasons for rejection that apply to **claims 1, 3, 5, 7** also apply to **claim 8**.

19. With respect to **Claim 9, Flaum et al.**, discloses a method and apparatus" {See figures 1-4, 8a, 8b, and 9}. **Flaum et al.**, lacks directly teaching that the apparatus comprises "a heater for heating the emulsion flow" explicitly. However, because **Flaum et al.**, teaches that the temperature of the reservoir (i.e. which includes the emulsion mixture of heavy oil and water being tested within the well-bore) is determined by the CMR depth of investigation using the current reservoir conditions, [See col. 15 line 67 through col. 16 line 10], and because the earths core and the earth's air-pressure in the borehole effectively function as a natural intrinsic reservoir heater, as the depth of investigation is increased into the earth, the **Flaum et al.**, reference does anticipate and provide an intrinsic teaching for the earth itself functioning as a natural "heater", even though the term "heater" is not explicitly stated by the **Flaum et al.**, reference. The examiner notes that in the **Flaum et al.**, reference intrinsically has within its scope a

Art Unit: 2859

naturally occurring heater (i.e. the earth itself), because the borehole formation reservoir is located within the earth, and the earth effectively heats the "emulsion flow" (i.e. the combinational mixture of heterogeneous or dissimilar fluids: such as light and heavy formation oil, water, oil base mud, NiCl doped water, or hexane which are considered by the examiner to be an intrinsic emulsion flow), "within the reservoir", based upon the current reservoir conditions. The same reasons for rejection, that apply to **claim 5** also apply to **claim 9**. The same reasons for rejection, that apply to **claims 1, 3, 5** also apply to **claim 9**.

20. With respect to **Claim 10, Flaum et al.**, teaches and shows "An apparatus for determining the oil content of a fluid emulsion comprising heavy oil and water" [See abstract, Figure 1] "comprising: (a) means for obtaining a sample of the emulsion;" [See col. 8 lines 26-47; col. 11 line 60 through col. 16 line 60; Figure 1] (b) a low field NMR relaxometer for measuring the T2 spectrum of the sample;" [See col. 5 lines 20-34; col. 5 lines 39-54; col. 8 lines 26-47] "(c) means connected to the NMR relaxometer for measuring total T2 amplitude below a T2 cutoff value, wherein a substantial portion of the spectrum attributable to the oil is at T2 values less than or equal to the T2 cutoff value;" (i.e. the means in the **Flaum et al.**, reference is the processor subsystem 7) [See Figure 1 col. 6 line 36 through col. 7 line 3; col. 4 lines 12-14; col. 8 lines 20-47] "and (d) means for converting the total T2 amplitude value to a weight value" (i.e. the means in the **Flaum et al.**, reference is the processor subsystem 7) [See Figure 1 col. 6 line 36 through col. 7 line 3] The same reasons for rejection, that apply to **claims 1, 3, and 5** also apply to **claim 10**.

21. With respect to **Claim 11, Flaum et al.**, teaches "A method of determining the oil content and water content of a fluid emulsion comprising heavy oil and water comprising the steps of: (a) providing a low field NMR relaxometer; (b) measuring and recording the T2 relaxation spectrum of the emulsion at a temperature allowing recovery of the T2 spectrum of the heavy oil; (c) determining a T2 cutoff value; (d) measuring the total amplitude of the spectrum at T2 times less than and equal to the T2 cutoff value (A_{oil}); (e) converting A_{oil} to a weight value by dividing A_{oil} by the amplitude index of an oil standard of known weight (AI_{oil}); (f) measuring the total amplitude of the spectrum at T2 times greater than the T2 cutoff value (A_w); and (g) converting A_w to a weight value by dividing A_w by the amplitude index of a water standard of known weight (AI_w)", because this claim is just **claims 1 and 3** combined, written in independent form. Therefore, the same reasons for rejection, that apply to **claims 1 and 3** also apply to **claim 11** and need not be reiterated.

22. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

23. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tiffany Fetzner whose telephone number is: **until January 27th 2003** (703) 305-0430. After **January 27th 2003** (571) 272-2241. The examiner can normally be reached on Monday-Thursday from 7:00am to 4:30pm., and on alternate Friday's from 7:00am to 3:30pm.

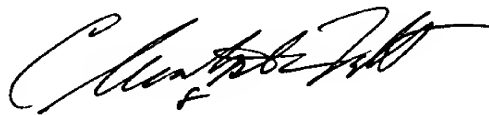
25. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez, can be reached on (703) 308-3875: **until February 10th 2003** After **February 10th 2003** (571) 272-2245. The **only official fax phone number** for the organization where this application or proceeding is assigned is **(703) 872-9306**.

26. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0956.



TAF

January 3, 2004



Diego Gutierrez

Supervisory Patent Examiner

Technology Center 2800

CHRISTOPHER W. FULTON
PRIMARY EXAMINER